

PATENT SPECIFICATION



Inventor: JOHN CHARLES SHARMAN

710,707

Date of filing Complete Specification: Oct. 1, 1952.

Application Date: July 2, 1951. No. 15589/51.

(Patent of Addition to No. 686,683 dated Nov. 28, 1950).

Complete Specification Published: June 16, 1954.

Index at acceptance:—Class 61, K2F, V3B, W4(F: X).

COMPLETE SPECIFICATION

Improvements in or relating to Screw-Drivers, Wrenches and like Tools

We, GARRINGTONS LIMITED, a British Company, of Albert Works, The Green, Darlaston, in the County of Stafford, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to screwdrivers, wrenches and like hand operated tools for operating on screws, bolts, nuts and like threaded members, and is intended primarily for application of such hand operated tools for use in loosening or removing such threaded members under circumstances in which they are unduly tight in position so that they cannot be loosened or removed by ordinary screwdrivers, wrenches and the like of conventional form which merely exert a steady torque on the threaded member with which they are engaged.

The present invention is an improvement in or modification of the invention which is the subject of our prior Specification for Patent No. 686,683, in the Complete Specification of which we have described and claimed a tool for the foregoing purpose comprising an operating element adapted operably to engage with a threaded member to be loosened, removed or tightened, a striking head element adapted to be hit by a hammer or other percussion tool, means connecting said striking head element to said operating element to permit of said striking head element moving suddenly relatively to the said operating element through a limited distance in the direction of the impact exerted by the percussion tool, means for causing said relative movement to apply impact torque to said operating element to turn the threaded member in the desired direction, resilient means acting between said striking head element and operating element to control and cushion the relative movement between these

elements and to return the same after the impact of the percussion tool back into their initial relative position so that the striking head element is ready to receive a further blow, means whereby during the impact of the percussion tool on the striking head element the latter can be held against rotation about the axis of turning of the threaded member, said means comprising the provision on the striking head element of handle-supporting means adapted to permit of a handle member being temporarily disposed in an operative position relative to the striking head element in which it extends laterally of the axis of rotation of the tool and serves to hold the striking head element against rotation about said axis when the handle member is grasped by one hand of the user, leaving the other hand of the user free to wield the percussion tool, said handle-supporting means being adapted to permit of the handle member being displaced into an inoperative position in relation to the tool in which the tool can be readily rotated manually in the normal way merely by grasping the exterior of the tool between the fingers of the user's hand.

With the particular construction described in our Complete Specification aforesaid, the tool when struck by a hammer or the like is capable of turning the threaded member in one particular direction only, it being necessary with the particular construction described in such Specification to provide a second similar but not identical tool to enable the threaded member to be turned in the other or opposite direction.

The present invention has for its object the provision of an improved construction whereby a single tool may be employed capable of turning the threaded member in either direction as required by the operator.

According to the present invention one of the aforesaid two elements of the tool is pro-

[Price 2/8]

vided with two sets of abutment surfaces, each set being inclined in a direction opposite to that of the other set and in relation to the axis of relative rotation of said two elements, 5 the other of said two elements having operably and displaceably associated therewith an abutment surface-engaging part adapted as required by the operator to be engaged operably with one or the other of the 10 two sets of abutment surfaces so as to cause the operating element to turn relatively to the striking head element in either of two opposite directions as desired when the striking head element is hit by a hammer or other 15 percussion tool.

With such an arrangement the threaded member may be turned in either of two opposite directions as required.

Preferably one of said two elements has 20 rigidly connected thereto a tubular portion provided with two pairs of slots so as to provide four such slots in all entirely separate from one another, the two slots in each pair being disposed on diametrically opposite 25 sides of said tubular portion with one pair of slots inclined oppositely to the other pair of slots in relation to the axis of relative turning of the two elements, the other of said two elements being provided with a pin 30 mounted removably thereon and extending substantially diametrically in relation to said axis, said pin being adapted to be engaged with the sides of one or the other of the two pairs of slots, the arrangement being such 35 that the pin can be removed from the tool by a movement in a direction parallel to its length and inserted through one or the other of the two pairs of slots and the element on which the pin is provided, such pin in either 40 of these two operative positions being adapted to transmit torque between the two elements about said axis.

By providing two pairs of slots each entirely 45 separate from one another, once the operator has disposed the pin in operative engagement with one pair of slots there is no possibility, however the two elements are rotated relatively, of the pin becoming disengaged from said one pair of slots and becoming accidentally 50 engaged with the other pair of slots so that when the tool is subsequently struck, a torque is applied to the threaded member in the wrong direction.

This is of importance particularly in the 55 removal of an unduly tight threaded member, as if torque is applied to the threaded member in a tightening direction accidentally, the kerf or head on the member may be damaged, rendering it more difficult to remove subsequently.

Preferably each of the slots referred to is provided in an exterior part of the tool so as to be readily visible to the operator who can then tell at a glance that the pin is in 60 engagement with the requisite pair of slots.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of one form of tool embodying the present invention.

Figure 2 is a sectional view on the line 70 2—2 of Figure 1.

Referring to the drawings, the invention is depicted as applied to a screwdriver which is generally similar to the construction illustrated in Figures 3 and 4 of the drawings 75 accompanying our Complete Specification No. 686,683, but with the present arrangement the tubular portion 16 of the tool referred to in the prior Specification is provided with two pairs of slots 17a, 17b, 80 instead of a single pair of slots as in the arrangement shown in the prior Specification.

As in the latter case, the two slots in each pair are arranged on diametrically opposite sides of the axis of rotation of the tool with 85 the two slots in each pair inclined by the same angle in relation to the axis of rotation of the tool, but with the present arrangement one pair of the slots is inclined in relation to said axis in a direction opposite to the 90 direction of inclination of the other pair of slots.

The sides 35 of these slots constitute abutment surfaces provided on the striking head element 12 of the tool, and the other element 95 of the tool, namely, the operating element 10, is provided as in each of the arrangements described in the prior Specification, with a pin extending diametrically therethrough, which pin is adapted to be engaged 100 between the sides of either pair of slots.

For this purpose the pin 18 is removable in relation to the element 10 by being displaceable relative thereto in a direction along its length, and to facilitate the removal of the 105 pin 18, it is provided at one end with a knurled portion 36 whereby it can readily be gripped, and it will be understood that by inserting the pin through one or the other of the two pairs of slots so that it passes in each case through the diametrical hole provided for this purpose in the element 10, the tool when operated on in the manner described in the prior Specification will have its operating element 10 displaced in one or the other of 115 two opposite directions.

Accordingly a tool embodying the present invention is well adapted for both left- and right-hand operation so that the same tool can readily be used for tightening or loosening threaded members, the screw-threads of which are of either left- or right-hand form so that a tool in accordance with the present invention is particularly convenient in use.

As will be observed, the two pairs of slots 125 17a, 17b are entirely separate from one another so that there is no danger of the pin becoming accidentally disengaged from one pair of these slots and accidentally engaged with the other pair of slots.

The remaining parts of the tool are constructed as described in our prior Specification.

What we claim is:—

5 1. The improvement in or modification of the tool claimed in our prior Specification No. 686,683, which consists in providing one of the said two elements of the tool with two sets of abutment surfaces, each set being 10 inclined in a direction opposite to that of the other set and in relation to the axis of relative rotation of said two elements, the other of said two elements having operably and displaceably associated therewith an abutment 15 surface-engaging part adapted as required by the operator to be engaged operably with one or the other of the two sets of abutment surfaces so as to cause the operating element to turn relatively to the striking head element 20 in either of two opposite directions as desired when the striking head element is hit by a hammer or other percussion tool.

2. The improvement in or modification of the tool claimed in our prior Specification 25 No. 686,683, wherein one of the said two elements has rigidly connected thereto a tubular portion provided with two pairs of slots so as to provide four such slots in all entirely 30 separate from one another, the two slots in each pair being disposed on diametrically opposite sides of said tubular portion with one pair of slots inclined opposite to the other pair of slots in relation to the axis of relative turning of the two elements, the other of

said two elements being provided with a pin 35 mounted removably thereon and extending substantially diametrically in relation to said axis, said pin being adapted to be engaged with the sides of one or the other of the two pairs of slots, the arrangement being such 40 that the pin can be removed from the tool by a movement in a direction parallel to its length and inserted through one or the other of the two pairs of slots and the element on which the pin is provided, such pin in either 45 of these two operative positions being adapted to transmit torque between the two elements about said axis.

3. The improvement or modification claimed in preceding Claim 2, wherein each 50 of the slots is provided in an exterior part of the tool, for the purpose specified.

4. The improvement or modification claimed in preceding Claim 2 or 3, wherein the pin is provided with a handle portion adapted to 55 be gripped by the user, for the purpose specified.

5. A screwdriver for loosening, removing or tightening screws, substantially as herein-before described with reference to, and as 60 shown in the accompanying drawings.

FORRESTER, KETLEY & CO.,

Chartered Patent Agents,

Central House, 75, New Street,

Birmingham, 2, and

Jessel Chambers, 88/90, Chancery Lane,

London, W.C.2.

PROVISIONAL SPECIFICATION

Improvements in or relating to Screw-Drivers, Wrenches and like Tools

We, GARRINGTONS LIMITED, a British Company, of Albert Works, The Green, Darlaston, in the County of Stafford, do 65 hereby declare this invention to be described in the following statement:—

This invention relates to screw-drivers, wrenches and like hand operated tools for operating on screws, bolts, nuts and like 70 threaded members and is intended primarily for application to such hand operated tools for use in loosening or removing such threaded members under circumstances in which they are unduly tight in position so that 75 they cannot be loosened or removed by ordinary screw-drivers, wrenches and the like of conventional form which merely exert a steady torque on the threaded member with which they are engaged.

80 The present invention is an improvement in or modification of the invention which is the subject of our prior specification for

patent No. 686,683 in the complete specification of which we have described and claimed a tool for the foregoing purpose comprising 85 an operating element adapted operably to engage with a threaded member to be loosened, removed or tightened, a striking head element adapted to be hit by a hammer or other percussion tool, means connecting 90 said striking head element to said operating element to permit of said striking head element moving suddenly relatively to the said operating element through a limited distance in the direction of the impact exerted by the 95 percussion tool, means for causing said relative movement to apply impact torque to said operating element to turn the threaded member in the desired direction, resilient means acting between said striking head element 100 and operating element to control and cushion the relative movement between these elements and to return the same after the impact of

the percussion tool back into their initial relative position so that the striking head element is ready to receive a further blow, means whereby during the impact of the percussion tool on the striking head element the latter can be held against rotation about the axis of turning of the threaded member, said means comprising the provision on the striking head element of means for permitting 10 of a handle member being releasably disposed in an operative position relative to the striking head element in which it extends laterally of the axis of rotation of the tool so that the striking head element can be held against 15 rotation about said axis when the handle member is grasped by one hand of the user leaving the other hand of the user free to wield the percussion tool, the handle member being adapted to be disposed in an inoperative 20 position in relation to the tool when required, for the purpose specified.

With the particular construction described in our complete specification aforesaid, the tool when struck by a hammer or the like is 25 capable of turning the threaded member in one particular direction only, as explained in the specification it being necessary to provide a second similar tool having the slots described in such specification differently 30 inclined to enable the threaded member to be turned in the other direction.

The present invention has for its object the provision of an improved construction whereby a single tool may be employed capable of 35 turning the threaded member in either direction as required by the operator.

According to the present invention one of the aforesaid two elements of the tool is provided with two sets of abutment surfaces, each 40 set being inclined in a direction opposite to that of the other set to the axis of relative rotation of said two elements, the other of said two elements having operably and displaceably associated therewith an abutment 45 surface engaging part adapted as required by the operator to be engaged operably with one or the other of the two sides of an abutment surface so as to cause the two elements to turn 50 relatively in either of two opposite directions as desired when the striking head element is hit by a hammer or other percussion tool.

With such an arrangement the threaded member may be turned in either of two opposite directions as required.

55 In a more specific form of the invention one of said two elements has rigidly connected thereto a tubular portion provided with two pairs of elongated openings so as to provide four such openings in all entirely separate 60 from one another, the two openings in each pair being disposed on diametrically opposite sides of said tubular portion with one pair of openings inclined oppositely to the other pair of openings in relation to the axis of relative 65 turning of the two elements, the other of said

two elements being provided with a pin 70 extending substantially diametrically in relation to said axis, mounted removably on said other element, the arrangement being such that the pin can be removed by a movement in a direction parallel to its length so as to be engaged with one or the other of said two pairs of elongated openings as required.

By providing two pairs of such elongated 75 openings each entirely separate from one another, once the operator has disposed the pin in operative engagement with one pair of openings there is no possibility however the two elements are rotated relatively, of the 80 pin becoming disengaged from said one pair of openings and becoming accidentally engaged with the other pair of openings so that when the tool is subsequently struck, a torque is applied to the threaded member in the wrong 85 direction.

This is of importance particularly in the removal of an unduly tight threaded member as if torque is applied to the threaded member in a tightening direction accidentally, the kerf 90 or head on the member may be damaged rendering it more difficult to remove subsequently.

95 Preferably each of the elongated openings referred to are provided in an exterior part of the tool so as to be readily visible to the operator who can then tell at a glance that the pin is in engagement with the requisite pair of openings.

In a particular specific arrangement the 100 tool would be constructed exactly as described and shown in Figures 1 and 2 of our complete specification No. 686,683, but with the tubular portion 16 therein mentioned provided with a second pair of slots 17 spaced 105 circumferentially through substantially 90° in relation to the existing pair of slots, the two slots in such further pair on diametrically opposite sides of the tubular portion 16 being inclined oppositely to the direction of inclination of the existing slots but by the same angle, in relation to the axis of the tool.

The pin 18 referred to in such specification would be removable by displacing in a direction along its length so as to permit of it 115 engaging with one or the other of the two pairs of slots as desired.

In applying the present invention to the construction shown in Figures 3 and 4 of our prior specification aforesaid, one end of the 120 pin may be formed with an arcuate head extending circumferentially of the tubular portion 16, the upper edge of such head being adapted to engage in either operative position of the pin with the outer end edge of one of 125 the ears on the pivoted handle member referred to in such specification, so that in either operative position of the pin the device can be used as an ordinary screw-driver or other ordinary tool if desired as described in 130

our specification aforesaid.

A tool in accordance with the present invention is well adapted for both left and right-hand operation so that the same tool can 5 readily be used for tightening or loosening threaded members, the screw threads of which are of either left or right-hand form so that a tool in accordance with the

present invention is particularly convenient in use.

10

FORRESTER, KETLEY & CO.,
Chartered Patent Agents,
Central House, 75, New Street,
Birmingham, 2, and
Jessel Chambers, 88/90, Chancery Lane,
London, W.C.2.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1954.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which
copies may be obtained.

THIS PAGE BLANK (USPTO)

710,707
1 SHEET

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale.*

FIG. 1.

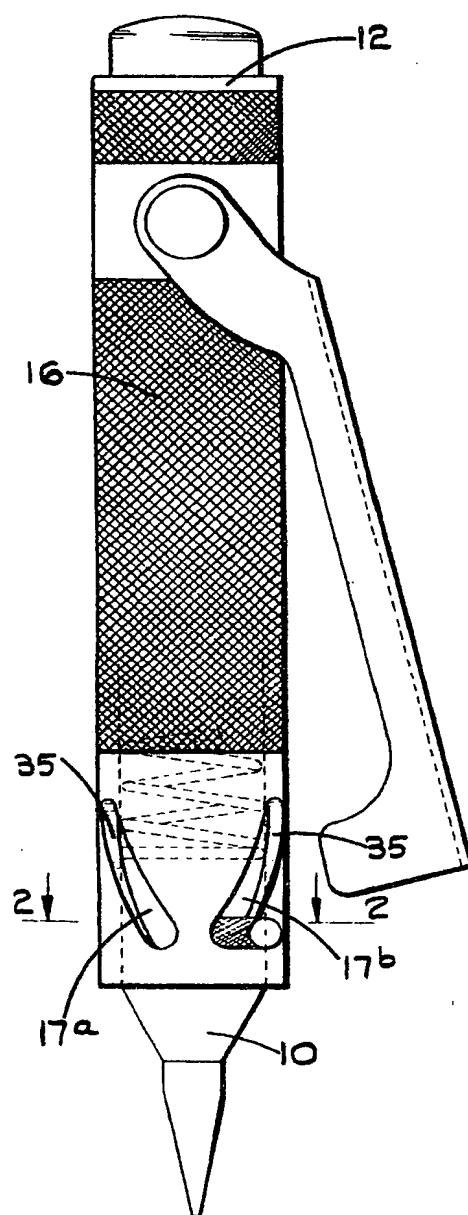
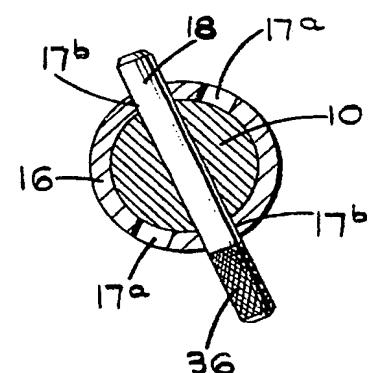


FIG. 2.



THIS PAGE BLANK